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ABSTRACT

The concern of this paper is the problem of overcrowding in large city schools and its effect on human behavior and student achievement. It opens with a discussion of psychological and sociological research on animals that has implications for humans in overcrowded environments. Also discussed are teacher-student relationships and administrator behavior, as well as a study that shows decreased student involvement in extracurricular activities as school size increases. The paper concludes with program suggestions for small secondary schools that would increase opportunities for individualized instruction and independent study. (LD)

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THE EFFECTS OF CROWDING ON HUMAN BEHAVIOR AND STUDENT ACHIEVEMENT IN SECONDARY SCHOOLS

OFFICE OF
CURRICULUM and INSTRUCTION
• THE SCHOOL DISTRICT OF PHILADELPHIA •

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THE EFFECTS OF CROWDING ON HUMAN BEHAVIOR AND STUDENT ACHIEVEMENT IN SECONDARY SCHOOLS

By

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OFFICE OF
CURRICULUM and INSTRUCTION
THE SCHOOL DISTRICT OF PHILADELPHIA • 1975

TABLE OF CONTENTS

	Pages
INTRODUCTION	1
PSYCHOLOGICAL AND SOCIOLOGICAL BACKGROUND	3
TEACHER-STUDENT RELATIONSHIP	5
STUDENT ACHIEVEMENT	7
TEACHER MORALE	10
ADMINISTRATOR'S BEHAVIOR	11
PROGRAMMATIC IMPLICATIONS	13
SUMMARY	17
CONCLUSIONS	19
END NOTES	21
BIBLIOGRAPHY	25

INTRODUCTION

There is, at present, an increased awareness of the implications and consequences of overpopulation, in general, and the concentration of population in urban areas, in particular. Our concern here is overcrowding in our large cities' schools and its effect on human behavior and on student achievement.

Most experimental evidence available dealing with behavior effects is based on animal research. However, this is quite useful, as shown in the section Psychological and Sociological Background.

"The prevailing idea of the appropriate size of high schools has risen sharply over the years. Intuition, authority and the American passion for size provide us with a numbers game -- that high schools should be no less than 750 or 1250 or 1500 or 1800 or 2200, etc. This inevitable drift toward largeness has been based upon a rigid interpretation of class size, grade level, and the role of the teacher as dispenser of information."[1] Other bases on which to determine effective and efficient size are discussed in the section Programmatic Implications. In preparing this section, the author consulted extensively with the heads of divisions of the Office of Curriculum and Instruction, The School District of Philadelphia.

PSYCHOLOGICAL AND SOCIOLOGICAL BACKGROUND

The sense of being crowded is generated when there is a clash between the images of the prevailing mood, those from the environmental stimuli and the brain itself. The evolution of our sociocultural situation has increased the frequency of these clashes. The subjective experience of being put upon and harassed by the mere presence of others, that is, being crowded, probably began when people had to become accustomed to living in large groups.[2] People became more human through the expanded function of the intellectual portion of the brain which enabled them to make reasonable accommodations with each other. However, the emotional portion of the brain continues to react in an unaccommodating manner, which sets emotional limitations on people's adaptations. One of these limits is the processing capacity of the brain of new stimuli. When the limit is reached, we feel crowded, whether it is by our own thoughts or by the presence of strangers.

A closer look at the feeling of being crowded, the result of an arousal state in the brain caused by the above-mentioned clashes, shows us that mood depends on the functional state of the central nervous system. Therefore, our brain does not always give us feelings appropriate to a particular environment. This is because human life today depends on adaptability to constantly changing environments and on cooperation between large groups of people of varying cultural backgrounds.[3]

Studies of crowding show that increased population density leads to increased social interaction. This leads, in mammals, to increased emotional involvement. Beyond a certain minimal density any social contact contributes to the arousal level.[4]

"Any prolonged state of high arousal constitutes stress and facilitates pathological responses to environmental stimuli. The best known example of pathological behavior in nature is the periodic mass exodus of lemmings from their habitat into a lake or the sea."[5]

Crowding is the perception of experiencing too little space. Both the real and imagined presence of others contribute to this perception. Only through subjective experiences does crowding disrupt behavior. This is caused by "the remembered and anticipated aspects of social interactions, as well as the actual proximity of others and the increase in the number of social contacts" contributing to crowding... "Being crowded (derived from a word meaning to press, to hasten or to drive) may be expressed as not being able to have one's way, being imprisoned, being burdened or encumbered."[6]

Another factor relating to man's subjective feeling of crowding is that social contacts crowd us only if they are inappropriate for the context.[7]

A feeling of stress may occur when a person's mood is not in accord with a particular interaction, when there are successive, different types of interactions during a day, or when many ideas crowd the mind and cause a need of privacy.

An organism cannot endure the stress of inappropriate social encounters for long without change. "It either dies, removes the stress, or only under artificial conditions, makes a long-term adaptation to the crowded situation."[8]

"In man, depending upon the attitudes of his social environment and the quality of his brain, many types of pathological behavior result from inappropriate social en-

counters. Aggressive and withdrawn behaviors have been shown to be short-term reactions to crowding in patients with diminished or disturbed brain functions. Long-term psychological adaptations may derive from the unconscious experience of crowding and the stress of inappropriate situations."[9]

Our cultural life causes us to feel crowded, at least periodically. This is a result of the conservative way in which our brain has undergone evolution. It still retains its ancestral animal structures. The sense of feeling crowded results from overload or otherwise dysfunctional states of the brain systems.[10]

People live in a constantly changing environment. If we fail to encode and habituate to the environment because of faulty brain mechanisms, the cumulative stress may exceed the brain's constitutional limitations to endure such experiences. Excessive arousal of the brain is harmful to people and is expressed by way of excessive adrenal hormonal function resulting in abnormal social behavior.[11]

We are concerned here with the factors that cause stimulus overload of the central nervous system. These factors lead to our feeling so pressed and overwhelmed that our ordinary defense mechanisms crumble and we appear to lose control. Some of the factors which contribute to stimulus overload are: (1) overpowering stimuli from the social and physical environments, especially if they are new; (2) generation of concepts leading to completely unfamiliar images on the intellectual portion of the brain; (3) a changed and lessening functioning of the central nervous system.[12]

"Unless we provide children from the start with conceptual space to incorporate the images of new human ways of life, we will not be able to overcome the pathology brought about by lack of environmental space."[13]

Much research has been done concerning crowded animal populations. How does this correspond to the problems of humans? The biochemical level of the physiological processes is found identical in mice and people. Marsden believes "there may be a true intellectual interface between studying the social dynamics of animals and those of man."[14]

Mice and people alike have no preknowledge of what the best population size of their universe should be. Even in optimum-sized groups, not all mice obtain full potential, full gratification. They sometimes experience frustration in fulfilling their role. There is usually present a mixture of frustration with gratification.

In controlled experiments "as the population exceeded the optimum and proceeded toward the maximum, processes evolved that resulted in the emergence of proportionally more and more divergent types of animals, animals deviating strongly from the ideal of how a normal mouse should behave..."[15]

Deviant behavior took a variety of forms. One was withdrawal - these mice did not experience defeat but did not approach their potential as members of their society, as if they had the attitude of not bothering to get involved. They seldom interacted and achieved neither gratification nor frustration. Some became aggressors and attacked other mice. They all exhibited a pathologically high frequency of nonadaptive social interaction.[16]

Experience with people in overcrowed conditions indicates that the human element of adaptability and understanding is lost in the largeness of the institution.[17]

TEACHER-STUDENT RELATIONSHIP

One of the most important considerations in determining secondary school size is that there be a wholesome atmosphere provided for students. This has an obvious relationship on behavior and achievement. An adolescent needs the guidance of parents and teachers who know him well. He has little experience regarding which habits and attitudes, learned while in school, will be harmful to his health and to his integrity. He must be encouraged in constructive and wholesome activities.[18]

The larger the school, the less likely that parents, teachers and students get to know each other well enough for effective, constructive counseling to occur. Damaging to any society is a large peer group of little-supervised adolescents who lack experience and who listen only to themselves or to an unscrupulous pressure group. Any large school has the potential for this type of situation. Good supervision of student conduct is very difficult, sometimes impossible, in most large schools. In a small school everyone and his deeds are known.[19]

A newspaper article tells of a study released by the Center for Research and Evaluation in American Liberties at Columbia University.[20] It "explores how students, treated as cattle in high schools, emerge woefully equipped to ... make the mature decisions essential in any democracy."[21] These are students from large schools who did not have the benefit of the steadying influence which a personal teacher-pupil relationship offers.

"The weight of evidence shows that teacher-pupil and school-community relations are better in small schools."[22] Because a school is small, each student is really needed, and senses this condition. The student has a sense of identity. It is an important counterbalance to the large, urban, impersonal culture in which he lives.[23]

The quality of counseling by school staffs is relative to how well the counselor knows the counseled. In small schools, since everyone knows everyone else in the school and many of the parents, as well, high quality guidance is obtainable.

School dropouts from large, urban areas say that no one seemed interested in them. It does not come as a surprise when one considers the impersonal nature of the student's school experiences. Schools must become more personal if pupil well-being is to exist and if there are to be fewer dropouts.

In large urban areas where there is a high rate of pupil turnover, special attention must be afforded the personal student-teacher relationship. Programs to ameliorate this impersonal situation in Los Angeles and Milwaukee were initiated several years ago. Research shows that children involved in the programs exhibit "accelerated intellectual growth, lessened incidence of negative attitude and behavior problems, and appear more school oriented."[24]

Educators must demonstrate empathy toward and an interest in the personal problems of the youth in their charge and encourage attitudes of commitment. It is extremely difficult to accomplish this in large metropolitan area schools.

NEA researchers found that:

> Each of the four nationwide biennial studies by the Research Division has brought out the fact that a child's chances of having a fair share

> of his teacher's time and attention depend, in large measure, upon the size of the district he lives in. It is clear that the greater the population of the district, the smaller are his chances of receiving the individual attention of his teacher.[25]

For our purposes we may substitute the word "school" for "district."

In a smaller school there exists a sense of loyalty, intimacy and friendliness toward the school and the teachers. There is a sense of identification. This sense of identification with the school, its personnel, and the student's peers inhibits deviant behavior.

STUDENT ACHIEVEMENT

A study was done on one aspect of a large public secondary school. It concerned itself with student participation in extracurricular activities. The assumption is that extracurricular activities indicate an interest in school life, a sense of involvement, a commitment, and are therefore valuable components of a school education. The findings show a "decreased student involvement in activities as high schools grow larger."[26] If participation in student activities is viewed as being basic to learning cooperation and leadership, as well as to having a rich and enjoyable school experience, then obviously large schools are undesirable.

For the purpose of the study, Kleinert named schools "small" with a population of 0-599, "medium" with a population of 600-1499, and "large" with 1500 or more students. Figures I, II, and III serve to elucidate the findings. One of the most conclusive findings of the study was that the proportionate number of student leaders decreased as schools of the sample grew larger.[27] This is illustrated in Figure III. There is a strong inverse relationship between school size and the total number of leadership roles available to students.

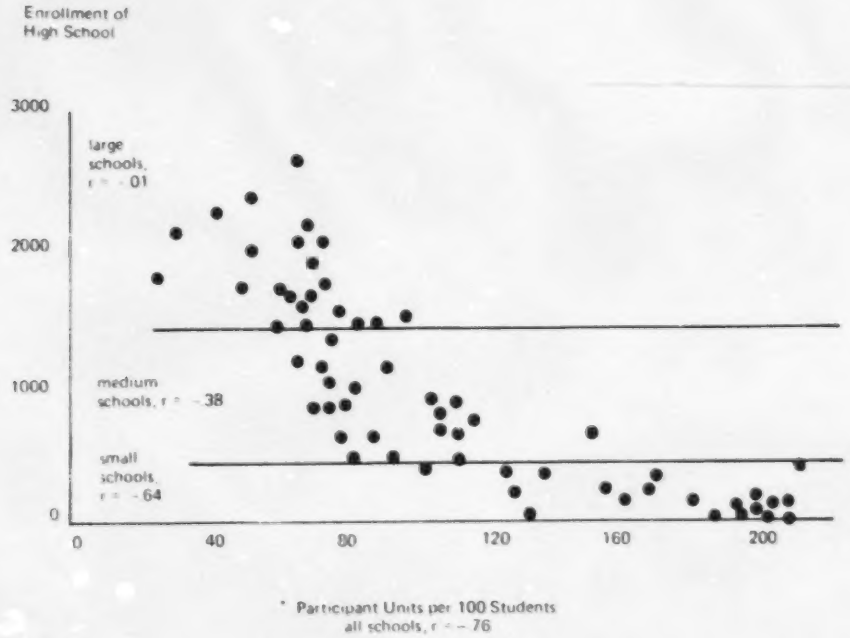


FIGURE I[28]

Enrollment and extent of total student participation in selected activities

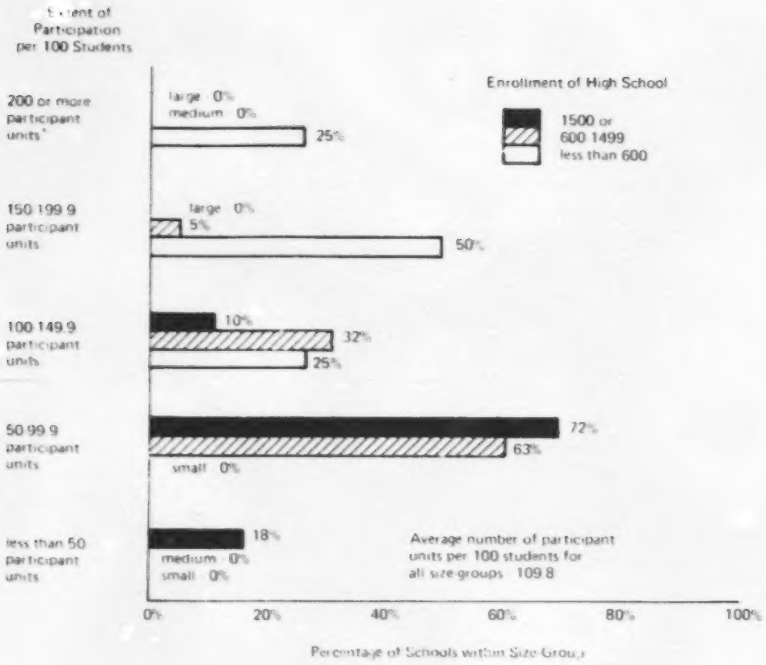
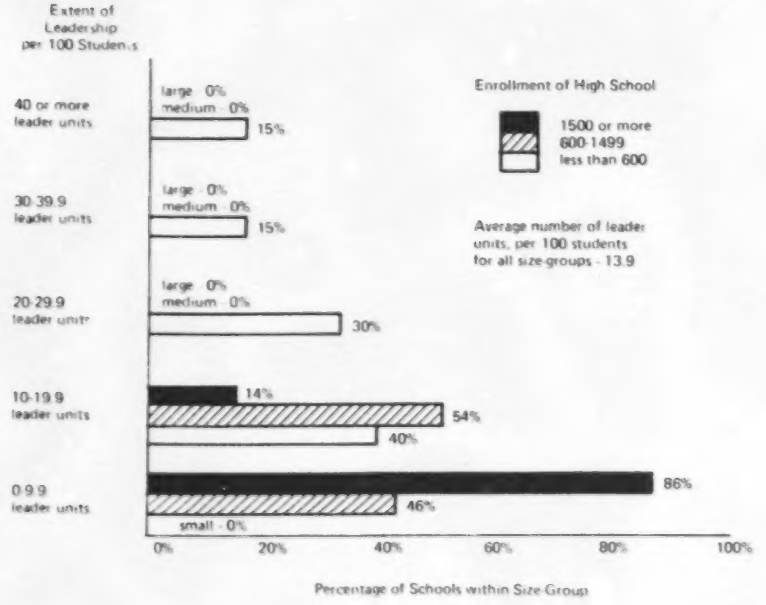


FIGURE II [29]

Extent of total student participation in selected activities for three size-groups of high schools



* A "leader unit" is one student serving as a leader in one activity. A student thereby may be counted more than once.

FIGURE III [30]

Extent of student leadership in selected activities for three size-groups of high schools

The conclusion of this study is that the student's opportunity to participate in a number of activities becomes less as the school grows larger. A very large school, because of its institutional character and impersonal masses, is less likely than the small school to help the average individual student with problems of personal identification. It fails to provide him with opportunities to take initiative, to enjoy recognition and to exercise leadership. The eagerness of the student to voluntarily participate in extracurricular activities is affected by his being one of 2,500 students, recognizing only a few faces outside his classes. His sense of identification with a school which has thousands of students is weaker than with a school in which he is a larger fraction of the whole.[31]

An attempt to bring about the student's closer identification with his school is being made with the advent of the "house plan." It is intended to create a warmer, more intimate atmosphere among the student body. The basis for this plan is the theory that the student benefits more from his high school education when he is in more regular contact with a small group of teachers and students.[32]

The great importance of participation in extracurricular activities is expressed by Kleinert thusly:

> When we confine the education of our young to formal academic experiences only, we deny them the opportunity to participate in meaningful social activities related to the school community which help them develop into contributing, mature citizens.[33]

Loyalty and individual responsibility are referred to in another study as "sense of obligation." It is hoped that a child will acquire a sense of obligation to school activities as he grows and develops. It is the sense that he feels "that his attendance, participation, and help are required for the success or continued functioning of the activity or group."[34]

Willems' study shows that a sense of obligation appears to be dependably and predictably related to school size.[35] In small schools, marginal students reported a sense of obligation that was similar in magnitude to their regular schoolmates. In the large school, the marginal students were a separate group and reported little, if any, sense of obligation.[36]

The evidence is consistent. As size of the unit increases, punctuality, attendance, identification with the group decreases.[37]

Academic and nonacademic achievements of students from small and large secondary schools were compared in another research study. The results showed that there are significant effects for size in four of the six areas of nonacademic achievement studied and for total nonacademic achievement. The effect of school size is substantial in writing, leadership, dramatic art and the total. In each of these, there is greater achievement among the small school students. Students in the smallest schools received the highest grades and reported the greatest number of school achievements in leadership, speech and drama.[38]

The total results show that "students' participation and achievement are considerably influenced by their immediate situation. Since the behavioral settings of small high schools encourage student participation, students apparently do participate and achieve more."[39]

Philosophically, there may be long-range effects of participation. Talent cannot be developed unless it is used. In small schools, accomplishment is more accessible to talented students. The students have opportunities to explore their talents and interests. Thus, small schools are better able to cause the student to develop his potential more fully than large schools. This is vital for both the student, as an individual, and for the constructive progress of society as a whole.

TEACHER MORALE

Large schools usually have teachers who specialize. Repetition of the same subject matter and learning concepts often leads to teacher boredom. In this regard, teachers in smaller high schools with more varied assignments have an advantage.[40]

The trouble-ridden large school has more difficulty with staffing. In large schools where student activism is not held in check, teacher morale is lower than elsewhere. The teachers feel, in this type of setting, a sense of frustration in their attempts at having the students learn. Working conditions in smaller schools are often more acceptable.[41]

Administrators also help to promote an impersonal climate in a large school. As intricacies of school operation increase, a principal can become oblivious to the real objectives of his building. The mechanics of operation can overwhelm him so that he sees his position only in relation to decisions regarding managerial efficiency.[42]

Middle and top-level administrators in large schools are often placed in a position where they have little leverage over the activities in organizational units under their supervision. Many systems have failed to maintain procedures to facilitate the flow of information up and down the administrative hierarchy. When a problem becomes known, it is often difficult to reach the administrator who would take the responsibility for or initiative to remedy it. As a result, apathy often develops. The feeling that "you can't beat the system" dominates the structure.[43]

The principal, the instructional leader of a school, finds himself in the frustrating position of not being an instructional leader, of not being in touch with the students in a large school. Instead, his talents, time and energy are consumed in performing administrative, often bureaucratic, tasks. This situation is greatly alleviated in a small school.

PROGRAMMATIC IMPLICATIONS

The majority of the secondary school curriculum should be devoted to liberal education if it is to produce a well-rounded person who has had sound and basic instruction in a variety of fields and a person who has a good positive attitude toward learning and toward his fellow man.[44] The high school should also offer instruction in commercial work, home economics, shop, the arts, and can offer additional vocational training.

Modern educational procedures provide bases other than class size, grade level and the traditional role of the teacher by which to determine the effective and efficient size of a secondary school. The student assumes responsibility for learning; the teacher is a guide in the learning process; information is transferred through audio-visual materials, well-designed books, programmed texts, as well as the teacher.[45]

A properly organized small secondary school can offer the diverse education discussed above with individualized instruction, non-graded and phasing approaches to instruction, and independent study. With creative use of present conceptual and technological breakthroughs, many of the limitations of a small school can be eliminated, while the students and staff can benefit from the advantages of smallness discussed in the previous sections.

Based on the "intuitive, auditor-type notion that the larger the institution, the cheaper and the better..."[46] our institutions have grown larger and our problems in society have increased. Part of the student unrest is seen as a rejection of this largeness. The necessity to hire security staff outweighs supposed savings on teaching staff. The clutter of rules and regulations needed to keep a large school going outweighs the presumed effectiveness of size.[47]

New curriculum developments, which take into account reorganized programs and human talent, can help make a small school workable and desirable.[48] The possibilities are limitless. Some examples are cited herewith:

Affective Education

A Communications Network Program could be established in each school. This program emphasizes use of the communication skills (listening, speaking, reading, writing) to create conditions which permit students to meet with repeated success and to form positive associations and to develop realistic expectations of themselves.

A Cross-Age Tutoring Program could be established. This would be done with students whose ages have a two-year difference. This helps with the older students' self-esteem and helps the younger students to get needed approval and acceptance from the older students.

A Family Studies Program could be instituted. This would focus on defining the family, i.e. what it is and how it functions and on exploring different models for parenting. This would be done so that the student can value and understand how his family is functioning and see societal options for restructuring the family.

African and Afro-American Studies

A learning center could be established. It would house exhibits containing artifacts relevant to African History and Culture. This learning center would be used by both students and teachers.

Art

Studios could be set up, designed to develop and encourage creativity and improve skills in a variety of media such as oil, water color, pen and ink, pastels, acrylic, etching, lithographs, silk screen, and sculpture.

Consumer Education

A curriculum materials center could be established in each school. It would house a variety of materials such as guides, pamphlets, cassettes, filmstrips, and sample lessons. It would also provide a place for interaction between the supervisory staff and the teachers for the purpose of teacher training.

Dual Audio-TV

Space could be used for expansion of the present program in order to prepare more dual audio-TV scripts. It could also be used to prepare recorded stories, dial-a-story and vocabulary lessons.

Foreign Languages

An Instructional Resource Center could be established. It would house reference materials in the many foreign languages taught in the schools, as well as materials for bilingual education and English to speakers of other languages. The materials would consist of films and filmstrips, periodicals, newspapers in various languages, records, tapes and sample textbooks. There would be listening stations in the Center for individual use by visitors. The Center would serve teachers and interested students. It could be a Center for staff development meetings and would be open for community meetings.

Language Arts

Reading centers could be established in which independent and individualized instruction would be fostered. This could be used for remediation in order to bring students to grade level and for enrichment for students who are achieving on or beyond grade level.

There could be literary stations where remediation would be offered in specific areas in which functional literacy levels had not been obtained.

Space could be designated in which development of the dramatic arts would be encouraged, nurtured and allowed to flourish.

In order to enable students to make effective use of ideas and information received through the mass media, workshops could be developed and programs structured. Laboratories and workshops could also be developed for the expression and transmission of ideas and information. Included in these would be organization of ideas, selection of modes of transmission and production techniques.

Libraries

Space would be available to set up quiet areas for individual or small group study and/or recreational reading. These areas could be adjacent to the existing Instructional Materials Center or located in other areas of the building. Specialized resource collections could be housed in these areas for independent in-depth study and/or research.

Some areas could be equipped with wet carrels (electrified individual study tables) enabling students to both view and listen to audio and video materials, many of which are self-instructional.

Mathematics

Mathematics laboratories could be established in each school. These prove to be highly motivational. Students have the opportunity to get involved in games and "hands-on" experiences which are at various levels. There would be a series of stations, each having a skill at different levels, permitting total individualization. The flexibility of this type of organization permits students to change activities based on their interests and needs. The activities are open-ended so that students may extend their discoveries. Students would be involved with helping each other, which also provides peer group reinforcement. The entire atmosphere is student centered.

The four major objectives of the mathematics laboratory are motivation; enrichment; articulation with the regular mathematics program; and review, reinforcement and remediation.

Multi-Media Instructional Resources

An Educational Media Center could be established. In this area, teachers would develop their competencies in using all equipment which would be used in a classroom. Software, to be used with the equipment, would be produced.

Mini-labs could be established for instruction in print and non-print media for teachers, students and community. It could include an area for print for layout for journalism and a photographic area with darkroom and equipment.

Music

There would be room in which to explore and expand the various aspects of music and their interrelationships with other areas of the curriculum such as language, creative writing, science, foreign language, mathematics, social studies, art and physical education.

The room would be set up as a Music Laboratory. Students could work on individual or group projects, discovering the elements and the physical properties of music. They could discover how and why different kinds of instruments work by playing them and

studying their structure. They could create music by recording "non-musical sounds," tape loops, instrumental and vocal sounds and organizing them into musical compositions. Space could also be provided for individual instruction and individual practice.

An Electronic Music Laboratory could be established. This would afford students the opportunity to develop their musical talent and creativity.

Science

Space could be used to set up individual activity centers for such things as electronics, photography, the biological sciences, physics, oceanography, meteorology, a live animal center, a planetarium area, a horticultural center, and individual projects by students.

There could be a great deal of individualized work including laboratory research, reading, writing, and preparation and presentation of projects on closed circuit television and videotape.

Some space could be used for staff development sessions in the above activities and for a Science Education display for teachers.

Social Studies

There could be a curriculum laboratory in which teachers would see demonstrations of new materials and techniques. It would serve as a resource room containing such things as books, pictures, filmstrips, slides. This is where curriculum specialists would consult with the teachers.

Volunteer Services

Tutoring could be conducted in small groups to reinforce classroom lessons.

SUMMARY

There are many features of small schools which give them the advantage over large schools. There is more concern for the individual student, more student involvement in the class and in extracurricular activities, more familiarity with the teacher and with fellow students, less competitiveness, more cohesiveness. There is a sense of identification, a sense of belonging, greater development of talent, less aggressive, hostile and violent behavior. The attributes of a small school result in higher student achievement, less deviant behavior, and higher faculty morale.

The administrator can perform in his primary function as instructional leader. The staff knows the students better and can, therefore, be of greater value of them.

CONCLUSIONS

Declining enrollments permit some schools the benefits of not being filled to capacity. It is vital that administrators be cognizant of the beneficial effects of maintaining underutilized schools and of smaller school organizations, as discussed.

The decline in enrollment should be looked upon as a positive element in educational organization. The underutilized schools can become more viable, more intimate than ever before. For the first time, the opportunity exists in which to provide this atmosphere without spending extra money. There can be greater programmatic flexibility, means of identification, small groups, informal space, lounges, personal relationships between faculty and students. These educational opportunities exist if underutilized schools are maintained at their current levels.

Administrators and school boards must be aware of the negative factors involved in large schools and/or overcrowding a small school.

The benefits which accrue emotionally, socially and educationally when overcrowding does not exist permit the school to do a better job; i.e., to provide a better educational atmosphere and a better education than is possible in overcrowded conditions. The results are fewer dropouts, less apathy, less vandalism, less absenteeism, greater achievement gains, greater leadership development, and a sense of identity.

It is important to weigh these factors when making decisions affecting existing schools as the population shifts and enrollments decline and when planning the construction of new, smaller schools.

There is a large price to be paid at the behavioral and achievement levels for conditions of overcrowding. It is difficult for large cities to have small schools. But, school size should be limited as much as possible, using the "house plan" where applicable. The more this is done, the easier it will be to prevent undesirable habits and poor attitudes from forming. The more this is done, the more likely it is that the product of our schools will be a well-adjusted, caring, productive citizen, living a fulfilling life and contributing positively to our society.

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[35]Willems, p. 1256.

[36]Willems, p. 1257.

[37]Willems, p. 1258.

[38]Leonard L. Baird, "Big School, Small School: A Critical Examination of the Hypothesis," Journal of Educational Psychology, 60 (August, 1969) 254-257.

[39]Baird, p. 258.

[40]Clements, p. 18.

[41]Clements, p. 20-21.

[42]Torrance and Strom, p. 130.

[43]Leslie H. Cochran, "An Ombudsman for Urban Schools," Bulletin of the National Association of Secondary School Principals, 53 (March, 1969) 57-58.

[44]Clements, p. 19.

[45]Leggett et al, p. 47.

[46]Leggett et al, p. 47.

[47]Leggett et al, p. 47.

[48]Leggett et al, p. 45.

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